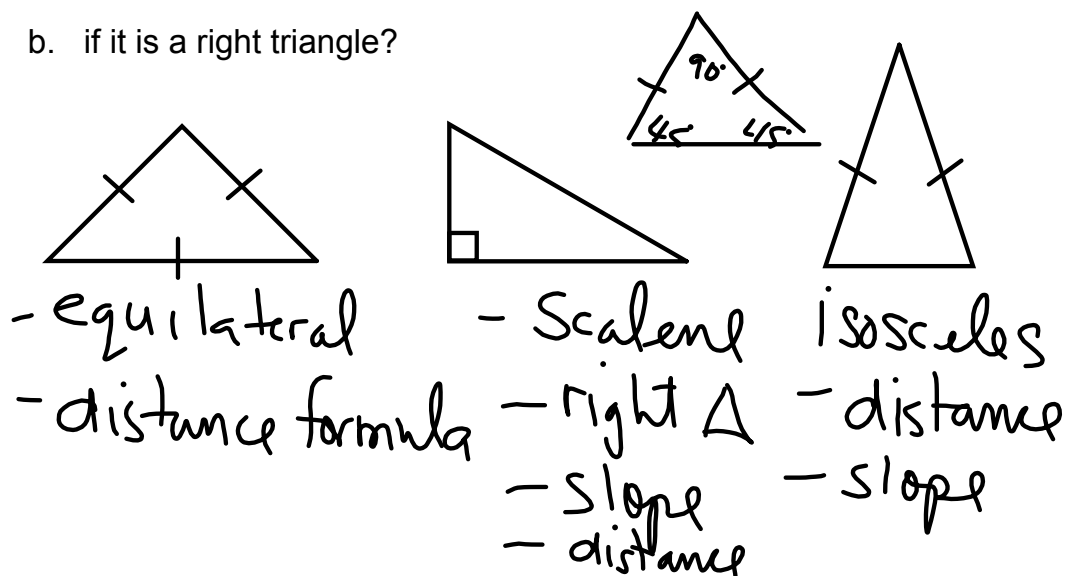


2.4 Classifying Geometric Figures:

Brainstorm your answers to the following.


1. Given the coordinates of 3 points, how would you determine:
 - a. what type of triangle you have? (equilateral, isosceles, or scalene)
 - b. if it is a right triangle?



Brainstorm your answers to the following.

2. Given the coordinates of 4 points, what is sufficient information to determine if the object is a:
 - a. parallelogram?
 - « opposite sides are parallel and congruent
 - « diagonals bisect each other (same midpoint)
 - « opposite angles are congruent
 - b. rectangle?
 - c. rhombus?
 - d. square?

Properties of Quadrilaterals

 congruent symbol - same shape and size

Property	Both pair of opp. sides are	Exactly one pair of opp. sides are	Both pair of opp. sides are \cong	Exactly one pair of opp. sides are \cong	All sides are \cong	Four right angles	Diagonals are \cong	Diagonals are \perp	Diagonals bisect each other	Two pair of adjacent sides \cong
Parallelogram	X		X						X	
Rhombus	X		X		X			X	X	
Rectangle	X		X			X	X		X	
Square	X		X		X	X	X	X	X	
Kite								X		X
Trapezoid		X								
Isosceles Trapezoid		X		X						

Classifying Geometric Figures

We are going to analyze some geometric theorems.
To do this, we will use the following tools:

- slopes of parallel & perpendicular lines
- distance formula
- midpoint formula

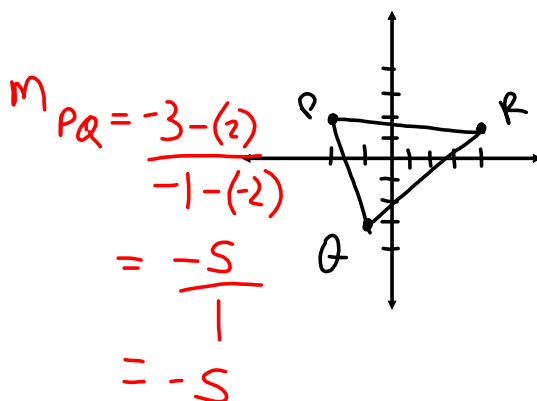
NOTE:

____ *When solving a problem involving a geometric figure, it is a good idea to start by drawing a diagram on a coordinate grid.*

Ex.1. A triangle has vertices at P(-2, 2), Q(-1, -3), and R(4, 1).

a) Show that this is NOT a right triangle.

$$\begin{aligned} m_{PR} &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{1 - (2)}{4 - (-2)} \\ &= \frac{-1}{6} \end{aligned}$$



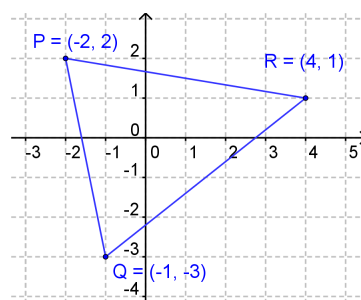
$$\begin{aligned} m_{RQ} &= \frac{-3 - (1)}{-1 - (4)} \\ &= \frac{-4}{-5} \\ &= \frac{4}{5} \end{aligned}$$

∴ The triangle is not a right angle triangle because there is no negative reciprocals.

Ex.1. A triangle has vertices at P(-2, 2), Q(-1, -3), and R(4, 1).

b) Show that the triangle is scalene.

$$\begin{aligned} d_{PQ} &= \sqrt{(-1 - (-2))^2 + (-3 - (2))^2} \\ &= \sqrt{(1)^2 + (-5)^2} \\ &= \sqrt{26} \end{aligned}$$



$$\begin{aligned} d_{QR} &= \sqrt{(4 - (-1))^2 + (1 - (-3))^2} \\ &= \sqrt{(5)^2 + (4)^2} \\ &= \sqrt{41} \end{aligned}$$

$$\begin{aligned} d_{PR} &= \sqrt{(4 - (-2))^2 + (1 - (2))^2} \\ &= \sqrt{(6)^2 + (-1)^2} \\ &= \sqrt{37} \end{aligned}$$

∴ it is a scalene Δ because all sides are different.

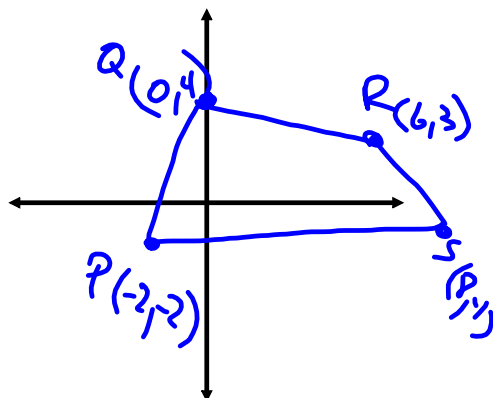
Ex.2. Determine the type of quadrilateral described by the points $P(-2, -2)$, $Q(0, 4)$, $R(6, 3)$, and $S(8, -1)$.

$$m_{QR} = -\frac{1}{6}$$

$$m_{PS} = \frac{1}{10}$$

$$m_{PQ} = 3$$

$$m_{RS} = -2$$



∴ it's an irregular quadrilateral because all slopes are different.

Assigned Work: p.101-103 # 2, 5, 6b, 7, 8, 11, 12, 16d